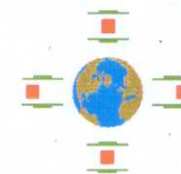




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STEP Requirements Plan

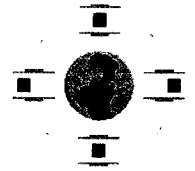
International Symposium on **Testing the Equivalence Principle in Space**

Ross Priory, Loch Lomond, Scotland

4-7 September, 2000

K. Dragon





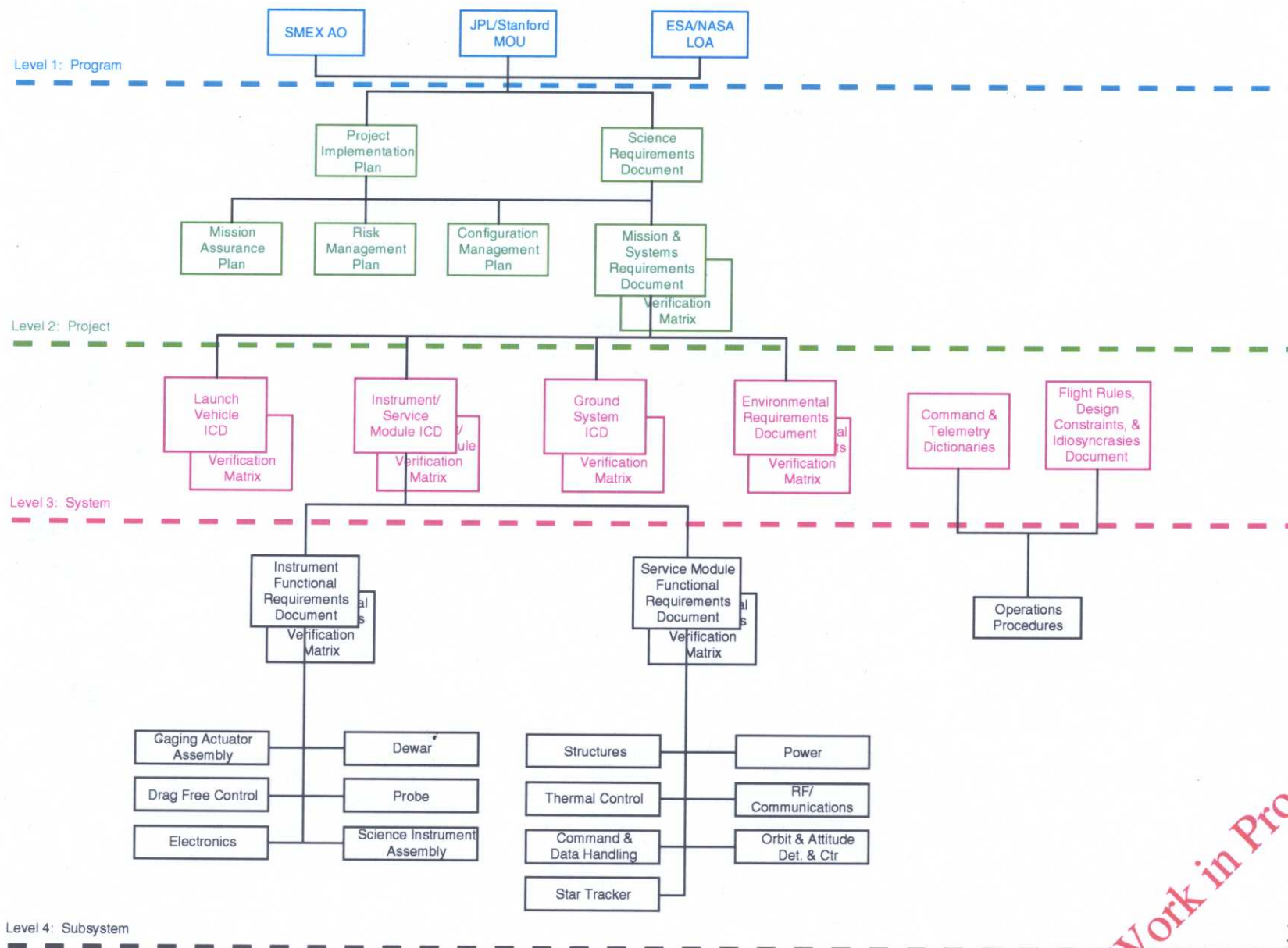
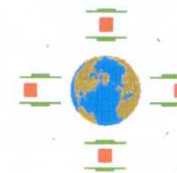
Agenda

- Document Tree
- Requirements Challenge
- Dynamic Object Oriented Requirements System (DOORS)
- STEP In DOORS
- Requirements Verification
- DOORS on the Web
- Open Issues
- Schedule
- Summary

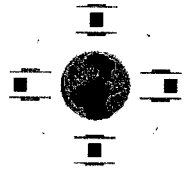
at
The work described herein was conducted by the Jet Propulsion Laboratory, California Institute of Technology under contract with the National Aeronautics and Space Administration.

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Document Tree



Work in Progress

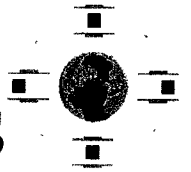


Requirements Challenge

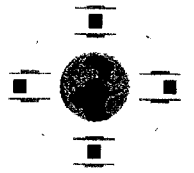
- STEP is a global project with worldwide partners.
- A cohesive set of requirements and requirements verification are necessary for building a spacecraft system that will achieve our mission objectives.
- In order to allow everyone to access the most recent information we need to record it in a place that is accessible by the entire project.

DOORS allows us to do this.

Dynamic Object Oriented Requirements System (DOORS)



- Electronic documentation and tracing tool
 - Allows collection of all requirements documents in one database
 - All of the requirements documents are different modules in the same database.
 - Allows users to link requirements
 - Sub-allocations can be linked back to the source requirements in other documents.
 - Allows users to track changes to requirements
 - Each time a requirement is changed a history is created that notes what the change is, when it was made, and who made it.



STEP in DOORS

- We have begun by inputting the Science Requirements Document into the DOORS database.
- The Mission and System Requirements Document is also in the process of being created in DOORS.
- As the database grows the STEP Environmental Requirements Document and Interface Control Documents will be added.
- All of these documents will be linked so that the requirements flow will be evident.

Science Requirements Document in DOORS



Virtual PC

DOORS: Formal module 'Science Requirements' current 0.0

Module Edit View Object Attribute Column Link Table Tools User Help

ID-Text-Rationale All levels

ID	Science Requirements	Rationale
1	1 Introduction	
2	This document contains the top level science requirements for the Satellite Test of the Equivalence Principle. The requirements presented here are supported by analysis described in Document SEA: STEP Error Analysis.	
3	2 Flowdown Structure	
6	The top level requirements consist of: R000: STEP Science Objective R001: Fundamental Science Requirements R002: Derived Science Requirements Design and Performance Requirements are detailed in a separate document.	
7	3 STEP Science Objective (R000)	
8	Test the Equivalence of Gravitational and Inertial Mass to 1 part in 10^{18} between selected test mass pairs of differing composition. By differing composition, we require that the masses differ in at least one scientifically definable property for which it is possible that new interactions exist. Examples of such properties include, but are not limited to: combinations of atomic number, Z and neutron number, N; baryon number, B, and lepton number, L; electrostatic energy density; and nuclear binding energy.	
9	4 STEP Mission Concept	

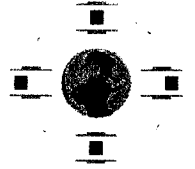
Start

DOORS: Project Manager ... DOORS: Formal modu...

Full Screen Eject Floppy Eject CD Folders

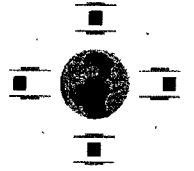
USB Ethernet Hard Drive CD ROM

2:05 PM



Requirements Verification

- As requirements are further developed our verification process will be incorporated into the database.
 - New columns will be added to incorporate verification information such as:
 - How the requirement was verified (Test, Analysis, ...)
 - Who verified the requirement
 - When the requirement was verified
 - References to any reports written
 - The end result will be a verification matrix that shows the requirements and their verification status.
 - The links between documents will allow us to ensure that all requirements are being verified.



DOORS on the Web

- The ability for all registered users to access the documents in DOORS via the Worldwide Web makes it ideal for STEP.
- Currently, only users actually logged in to the DOORS database can make changes to modules, however other users can view the updated modules in real-time through the web.
 - Users logged in through the web can also submit change requests or “suggestions”.



Netscape: DOORSNet: View contents

Back Forward Reload Home Search Netscape Images Print Security Shop Stop

Location: <http://doors/cgi-doorsnet/cgiwin.exe> What's Related

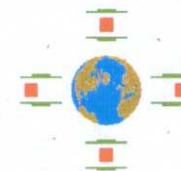
WebMail Contact People Yellow Pages Download Find Sites

Views Make suggestion Show proposals Preferences Close project
Search Sort Get entire module Help DOORSNet

Science Requirements : ID-Text-Rationale (1 to 30 of 50)

ID	Science Requirements	Rationale
1	1 Introduction	
2	This document contains the top level science requirements for the Satellite Test of the Equivalence Principle. The requirements presented here are supported by analysis described in Document SEA: <i>STEP Envir Analyses</i> .	
3	2 Flowdown Structure	
6	The top level requirements consist of: R000: STEP Science Objective R001: Fundamental Science Requirements R002: Derived Science Requirements Design and Performance Requirements are detailed in a separate document.	
7	3-STEP Science Objective (R000)	
8	Test the Equivalence of Gravitational and Inertial Mass to 1 part in 10^{18} between selected test mass pairs of differing composition. By differing composition, we require that the masses differ in at least one scientifically definable property for which it is possible that new interactions exist. Examples of such properties include, but are not limited to: combinations of atomic number, Z and neutron number, N; baryon number, B, and lepton number, L; electrostatic energy density; and nuclear binding energy.	

Science
Requirements
Document on
the Web



Web based "Change Suggestion" Form

Netscape: DOORSNet : Suggestion form

Back Forward Reload Home Search Netscape Images Print Security Shop Stop

Location: What's Related

WebMail Contact People Yellow Pages Download Find Sites

• Views • Make suggestion • Show proposals • Preferences • Close project
• Help **DOORSNet**

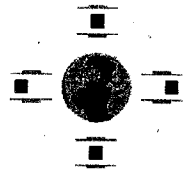
Suggestion

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Reason for change

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Change type: Priority:

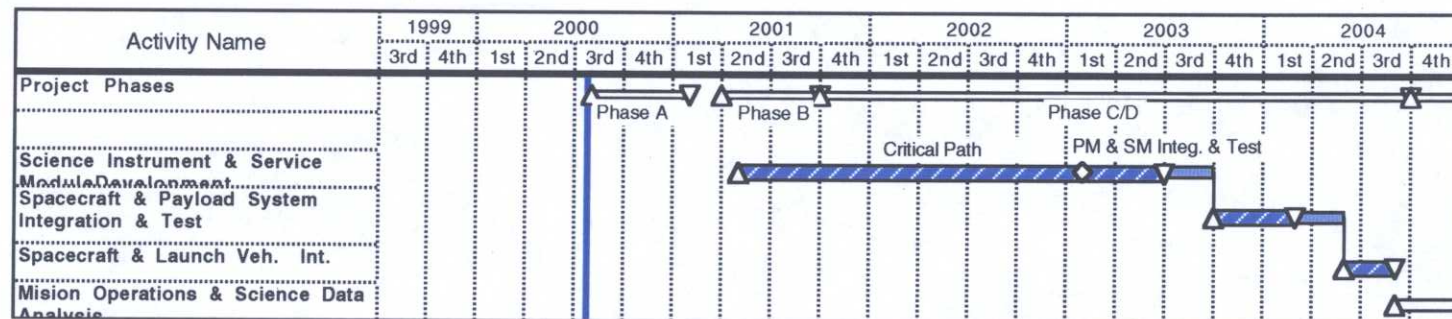


Open Issues

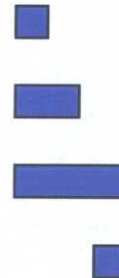
- Does everything belong in DOORS?
 - Some of the projects at JPL use DOORS as their project library and all of their documentation exists within it or links to it.
 - We have extensive error budgets for STEP. We need to decide whether to link those budgets to our requirements in DOORS.
 - We also need to decide how to map our modeling and simulations to the verification matrix

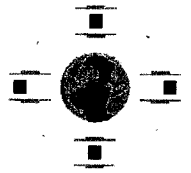


Schedule



- Document Tree
- Level 2 Requirements
- Level 3 Requirements
- Requirements Review





Summary

- Requirements creation is a key part in any program. As STEP progresses, the use of DOORS will allow us to track the evolution of our requirements.
- As more documents are input into DOORS, the linking capability will allow us to ensure that as the documents evolve, the changes are flowed to all of the affected systems.
- The addition of the verification matrix will allow us to ensure that all of our requirements are met.

DOORS will allow all of the members of the STEP team to participate in documenting, tracing, and managing our requirements.